# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

## Patent Application

Inventor(s):    Jozsef Kiraly

Title:    CHAINCAST METHOD AND SYSTEM FOR BROADCASTING INFORMATION TO MULTIPLE SYSTEMS WITHIN THE INTERNET

The Commissioner of Patents and Trademarks
Washington, D.C. 20231
Sir:

## Transmittal of a Patent Application
### (Under 37 CFR §1.53)

Transmitted herewith is the above identified patent application, including:

  X   Specification, claims and abstract, totaling   _21_   pages.

       Formal drawings, totaling        pages.

  X   Informal drawings, totaling   _6_   pages.

  X   Declaration and Power of Attorney.

       Information Disclosure statement.

       Form 1449

       Assignment(s)

       Assignment Recordation Form (duplicate)

       Preliminary Amendment

## FEES DUE

The fees due for filing the specification pursuant to 37 C.F.R. § 1.16 and for recording of the Assignment, if any, are determined as follows:

| CLAIMS | | | | | |
|---|---|---|---|---|---|
| | NO. OF CLAIMS | | EXTRA CLAIMS | RATE | FEES |
| Basic Application Fee | | | | | $760.00 |
| Total Claims | 14 | Minus 20= | 0 | X $18 = | $0.00 |
| Independent Claims | 2 | Minus 3= | 0 | X $78= | $0.00 |
| If multiple dependent claims are presented, add $260.00 | | | | | $0.00 |
| Add Assignment Recording Fee of $40.00 If Assignment document is enclosed | | | | | $0.00 |
| **TOTAL APPLICATION FEE DUE** | | | | | $760.00 |

## PAYMENT OF FEES

The full fee due in connection with this communication is provided as follows:

1.    Not enclosed

      [ ]    No filing fee is to be paid at this time.

2.    Enclosed

      [ X ]   Filing fee

      [ ]    Recording assignment

      [ ]    Petition fee for filing by other than all the inventors or person on behalf of the inventor where inventor refused to sign or cannot be reached

      [ ]    For processing an application with specification in a non-English language

      [ ]    Processing and retention fee

      [ ]    Fee for international-type search report

      [ X ]   The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No.: 23-0085. A duplicate copy of this authorization is enclosed.

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      This application is filed pursuant to 37 C.F.R. § 1.53 in the name of the above-identified Inventor(s).

      Please direct all correspondence concerning the above-identified application to the following address:

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      [ X ]   This transmittal ends with this page.

Respectfully submitted,

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UNITED STATES PATENT APPLICATION FOR

<u>CHAINCAST METHOD AND SYSTEM FOR BROADCASTING</u>

<u>INFORMATION TO MULTIPLE SYSTEMS WITHIN THE INTERNET</u>

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# CHAINCAST METHOD AND SYSTEM FOR BROADCASTING INFORMATION TO MULTIPLE SYSTEMS WITHIN THE INTERNET

5    ## BACKGROUND OF THE INVENTION

### FIELD OF THE INVENTION

The present invention relates to the field of digital information communication.  More specifically, the present invention relates to the field of computer implemented digital broadcast communication of information over

10    the Internet.

### RELATED ART

The Internet is a large network made up of a number of smaller networks.  It is made up of more than 100,000 interconnected networks in

15    over 100 countries, comprised of commercial, academic and government networks.  It has become commercialized into a worldwide information highway and data base, containing information on every subject known to humankind.

20    The proper and efficient use of the great amount of information available on various Internet sites has the potential of providing Internet users with a variety of information desired for businesses and individuals.  In particular, those users interested in certain segments of the information available on the Internet or those users interested in certain specific Internet

25    sites could benefit tremendously from having their specific information of interest available to them in an automated and interesting manner. Moreover, such users would benefit greatly from being constantly and

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automatically updated on new information as the new information becomes available on their sites of interest.

Due to the prevalence and popularity of the World Wide Web (also
5    called the "Web") servers around the world, a great number of Internet users are particularly interested in receiving updated information of interest to them from various World Wide Web servers on the Internet. By way of background, the World Wide Web is an Internet facility that links documents locally and remotely. The Web document is called a Web page, and links in the page let
10   users jump from page to page (hypertext) whether the pages are stored on the same server or on servers around the world. The pages are accessed and read via a Web browser such as Netscape Navigator or Microsoft Internet Explorer.

15   The Web has become the center of Internet activity since, among other reasons, Web pages, containing both text and graphics, are easily accessible via a Web browser. The Web contains the largest collection of online information in the world, and the amount of information is increasing. Current schemes for accessing a Web document require typing in the URL (Uniform
20   Resource Locator) address of the home page in the Web browser. From there, the user starts surfing through the Internet via hypertext links to other documents that can be stored on the same server or on a server anywhere in the world.

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The shear size of the information available on the Internet and the Web has made it a necessity for individuals and businesses to efficiently and constantly sift through the available information in order to find and organize the information that is of interest. Stated differently, individuals and

5   businesses realize that the availability of information itself does not result in a competitive edge unless the information is reduced to a manageable size and unless the information so reduced in size is of interest and of value to the business or the individual.

10   Figure 1 illustrates a system 70 regarding one use of the Internet. In system 70, the Internet 40 is used to provide a communication channel between a broadcast source 60 and a number of receiving devices 10, 12, 14. A digital broadcast signal, e.g., representing some audio/video content or program such as a radio program or television program, can be broadcast in

15   encoded digital packets from the source server 60 to the receivers 10, 12, 14. Although the broadcast content is the same for each receiver, a separate communication stream, comprising separate digital data packets, is required for each receiver that is coupled to the Internet. Therefore, three separate communication streams 20, 21 and 22 are shown as being broadcast from

20   server 60 onto the Internet 40. Stream 20 is identified and communicated for receiver 10, stream 21 is identified and communicated for receiver 12 and stream 22 is identified and communicated for receiver 14.

As a result of the above, it is clear that the number of users (receivers)

25   that can receive broadcasted information on the Internet simultaneously from

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one server 60 is limited mainly by the connection speed between the server 60 and the Internet 40 because each stream 20, 21, 22 consumes available bandwidth. For example, assuming it is desired to broadcast a radio program over the Internet to users, e.g., that visit the web site of the server 60 (Figure

5    1). Depending on the compression algorithm used, and on the number of users that want to listen to the program simultaneously, the server 60 needs to be connected to the Internet 40 with a speed of at least N x K bytes/s, where K is the bandwidth requirement for one user and N is the number of users able to listen to the program simultaneously. Assuming the server

10   connection to the Internet allows up to 100Mbit/s bandwidth, the number of listeners will be limited to roughly 20,000 per server, assuming roughly 5Kbits/s bandwidth requirement per user.

Accordingly, what is needed is a method and system that is able to
15   provide broadcast communication content to many users, pseudo simultaneously, without being limited to the bandwidth constraints of the server to Internet connection. The present invention provides such a solution.

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## SUMMARY OF THE INVENTION

What is described is a method to broadcast information over the Internet to many users pseudo -simultaneously solving the problem arising from the connection speed limitations between a server and the Internet.

5

A method and system are described herein for performing chaincast communication to multiple communication systems within a system of coupled electronic devices. In one implementation the electronic devices can be computer systems and the system of coupled electronic devices includes

10 the Internet. The present invention provides a system wherein a broadcast source communicates broadcast information (e.g., encoded audio radio content, encoded audio/video television content, program instructions, etc.) to a first group of electronic devices. The first group of electronic devices can be instructed by a transmission scheduler to then communicate (e.g., forward)

15 the broadcast information to other electronic devices, which devices can also be instructed to communicate to more devices, etc., thereby reducing the bandwidth requirements of the communication channel between the broadcast source and the first group of electronic devices. Typically, the communication channel between the broadcast source and the first group

20 involves the connection between the Internet and the server.

Slight communication delays may be encountered by the transmission forwarding, but these delays can typically be tolerated in broadcast transmissions (e.g., radio content, television content, seminars, etc.) because

25 they are not generally interactive. The transmission scheduler, coupled to the Internet, is used to track and manage which devices are forwarding broadcast information to which other devices. The transmission scheduler is able to re-

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route communications when one or more devices terminates or to provide better communication load sharing across the system. The communication is "chaincast" because the forwarding from one device to another, to another, etc., creates a logical communication "chain" from the broadcast server to and

5    through the receiving devices.

An embodiment of the present invention includes a method of communicating broadcast information comprising the steps of: a) causing a server to communicate a first stream representing digital broadcast

10    information to a first user device wherein the server and the first user device are coupled to the Internet; b) causing the server to communicate a second stream representing the broadcast information to a second user device wherein the second user device is coupled to the Internet; c) causing the first user device to communicate a third stream representing the broadcast

15    information to a third user device wherein the third user device is coupled to the Internet; and d) rendering, pseudo simultaneously, the broadcast information on the first, second and third user devices.

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## BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates a prior art information broadcast system using the Internet.

5      Figure 2 illustrates a general purpose computer system which can be used as an electronic device, a user, or a server in accordance with the present invention.

Figure 3A is an exemplary communication diagram of the chaincast communication method of the present invention.

10     communication method of the present invention.

Figure 3B is another exemplary communication diagram of the chaincast communication method of the present invention.

15     Figure 4 is an Internet connection diagram of the devices of Figure 3A.

Figure 5 illustrates a name table managed by the transmission scheduler of the present invention.

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## DETAILED DESCRIPTION OF THE INVENTION

In the following detailed description of the present invention, a system and method for communicating digital broadcast content to multiple users, pseudo simultaneously, without being constrained to the bandwidth of the

5    server-to-Internet connection, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be recognized by one skilled in the art that the present invention may be practiced without these specific details or with equivalents thereof. In other instances, well known methods, procedures, components, and circuits have

10    not been described in detail as not to unnecessarily obscure aspects of the present invention.

## NOTATION AND NOMENCLATURE

Some portions of the detailed descriptions which follow are presented

15    in terms of procedures, steps, logic blocks, processing, and other symbolic representations of operations on data bits within a computer memory. These descriptions and representations are the means used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art. A procedure, computer executed step, logic block,

20    process, etc., is here, and generally, conceived to be a self-consistent sequence of steps or instructions leading to a desired result. The steps are those requiring  physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical or magnetic signals capable of being stored, transferred, combined, compared,

25    and otherwise manipulated in a computer system. It has proven convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers, or the like.

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It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated

5 otherwise as apparent from the following discussions, it is appreciated that throughout the present invention, discussions utilizing terms such as "processing" or "computing" or "translating" or "calculating" or "determining" or "displaying" or "recognizing" or the like, refer to the action and processes of a computer system, or similar electronic computing device, that manipulates

10 and transforms data represented as physical (electronic) quantities within the computer system's registers and memories into other data similarly represented as physical quantities within the computer system memories or registers or other such information storage, transmission or display devices.

15 <u>COMPUTER SYSTEM 112</u>

Aspects of the present invention, described below, are discussed in terms of steps executed on a computer system. Aspects of the present invention are also discussed with respect to an Internet system including electronic devices and servers coupled together within the Internet platform.

20 A "server" and an "electronic device" or "user" can be implemented as a general purpose computer system. Although a variety of different computer systems can be used with the present invention, an exemplary computer system 112 is shown in Figure 2.

25 In general, computer systems 112 that can be used by the present invention comprise an address/data bus 100 for communicating information, a central processor 101 coupled with the bus for processing information and

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instructions, a volatile memory 102 (e.g., random access memory) coupled

with the bus 100 for storing information and instructions for the central

processor 101 and a non-volatile memory 103 (e.g., read only memory)

coupled with the bus 100 for storing static information and instructions for the

5    processor 101. Computer system 112 also includes a data storage device

104 ("disk subsystem") such as a magnetic or optical disk and disk drive

coupled with the bus 100 for storing information and instructions and a

display device 105 coupled to the bus 100 for displaying information to the

computer user.

10

Also included in computer system 112 is an alphanumeric input device

106 including alphanumeric and function keys coupled to the bus 100 for

communicating information and command selections to the central processor

101. Generally, alphanumeric input device 106 is called a keyboard or

15   keypad. System 112 also includes a cursor control or directing device 107

coupled to the bus for communicating user input information and command

selections to the central processor 101. The cursor directing device 107 is

typically displaced through user movement which causes a cursor image

displayed on screen 105 to move accordingly. Within the context of the

20   present invention, the cursor directing device 107 can include a number of

implementations including a mouse device, for example, a trackball device, a

joystick, a finger pad (track pad), an electronic stylus, an optical beam

directing device with optical receiver pad, an optical tracking device able to

track the movement of a user's finger, etc., or any other device having a

25   primary purpose of moving a displayed cursor across a display screen based

on user displacements.

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Computer system 112 of Figure 2 can also include an optional signal generating device 108 coupled to the bus 100 for interfacing with other networked computer systems, e.g., over the Internet. The display device 105 of Figure 2 utilized with the computer system 112 of the present invention

5    may be a liquid crystal device, other flat panel display, cathode ray tube, or other display device suitable for creating graphic images and alphanumeric characters recognizable to the user. In one embodiment of the present invention, computer system 112 is a Windows Operating System based computer system having an x86 architecture processor 101.

10

## CHAINCAST COMMUNICATION
## OF THE PRESENT INVENTION

Figure 3A illustrates an exemplary configuration in accordance with the present invention for performing "chaincast" communication within the

15    Internet system. Within Figure 3A, a broadcast server 260 supplies a broadcast content that a number of electronic devices a1-aj, b1-bk, c1 and c2 desire to receive "pseudo" simultaneously. This broadcast content ("program") can be of any nature or character that would be desired to be received by a number of users simultaneously, e.g., an encoded audio

20    program (e.g., a radio program), an encoded audio/visual program (e.g., a television program), an instructional seminar, a software program, etc. The broadcast content is typically encoded into individual data packets and broadcast digitally.

25    Chaincasting of the present invention does not require a high speed connection between the broadcast server 260 and the Internet 300 (Figure 4) and still allows practically an unlimited number of users to receive and render

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the broadcasted program.  The chaincasting method can be applied to any

kind of information broadcasting, including radio and television (TV).  For

simplicity, a radio broadcast is described as an example.

5        The present invention, instead of transmitting the information to many

users from a server, causes the server to transmit the information only to a

few users (e.g., a1-aj of Figure 3A) and then instructs these few users to

forward the information to the other users (e.g., b1-bk, c1 and c2) as needed.

This is chaincasting.  The present invention changes the paradigm of

10       information providers and information consumers because all users can relay

information to others thereby reducing the communication burden on the

server-to-Internet connection.  Instead of the old paradigm, the present

invention creates an information sharing community (Figure 3A) that utilizes

the Internet resources optimally.

15

In the example of Figure 3A, users a1-aj receive the broadcast content

directly from the server via separate information streams 310-313, which are

supported on the bandwidth resources of the connection between the Internet

300 (Figure 4) and server 260.  These streams each contain digital encoded

20       packets that make up the digital broadcast content.  The number of users, j, is

set based on the bandwidth supported by the connection between the

Internet 300 (Figure 4) and server 260.  Users a1-aj are instructed, by the

transmission scheduler 200, to forward the broadcast content to users b1-bk

in the fashion shown in Figure 3A.  A separate stream 320 is used between

25       users a1 and b1; a separate stream 324 is used between users a2 and b2; a

separate stream 326 is used between users a3 and b3;  and a separate

stream 330 is used between users aj and bk.  Users b1 and b3 are instructed,

by the transmission scheduler 200, to forward the broadcast content to users c1 and c2 in the fashion shown in Figure 3A. A separate stream 322 is used between users b1 and c1 and a separate stream 328 is used between users b3 and c2.

5

Communication "chains" are formed, e.g., chain1 is a1-b1-c1; chain2 is a2-b2; chain3 is a3-b3-c2 and chain4 is aj-bk. Software loaded within each user can be used to provide the forwarding functionality.

10    Each user of Figure 3A, registers with the transmission scheduler 200 which maintains and tracks the communication links established between the users. The transmission scheduler 200 load balances between the users so that the communication load is balanced to reduce latencies. Load balancing can be performed to maintain a uniform chain sizes. For example, if one user

15    is supplying a relatively larger number of other users (e.g., a chain size of four), then some of the receiver users can be moved from this chain such that they receive the information from other chains. It is possible for one user to receive broadcast information from more than one other user; the duplicate data can be ignored.

20

All users send status update messages to the transmission scheduler 200. Transmission scheduler 200 can use these status update messages to re-route communication links when one user becomes too slow, or shuts down. For instance, assume user b3 of Figure 3A shuts down. The result is

25    shown in Figure 3B where the transmission scheduler 200 created a new link 340 to directly connect user a3 to user c2. The transmission scheduler 200 creates and maintains the new link 340 (as well as all other links). Assuming

rendering pipelines are large enough with each user, the transfer between communication sources from Figure 3A to Figure 3B (with respect to user c2) can be performed transparently to user c2.

5        Figure 4 is a high level diagram of the Internet connection system of the devices of Figure 3A. The users, a1-aj, b1-bk, c1 and c2 are coupled to the Internet 300. The broadcast server 260 and the transmission scheduler 200 are coupled to the Internet. Server 260 and scheduler 200 can reside in separate computer systems or can reside within the same computer system.

10

         Figure 5 illustrates that the transmission scheduler 200 can be coupled with a name server 400 that contains a listing of IP addresses 412 for each user and each user has an associated unique name (column 410). This name server is used to establish communication links between users. If a first

15    user wants to talk to a second user, the first user informs transmission scheduler 200 of the communication link between itself and name of the second user. The transmission scheduler 200 then opens a direct link between the first and second users, over the Internet 300. The links shown in Figure 3A and Figure 3B can be opened using the name server in this

20    fashion, but the establishment of these links and the designation of users are controlled by the transmission scheduler 200.

         An example is given. On the broadcast server 260 is placed software that is operating with the following main functions: 1) multi-channel

25    information transmitter; 2) name server; and 3) the transmission scheduler 200. On the user side, each user device has an Internet radio software program ("Internet radio") operating that allows broadcast digital packets to

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be decoded to thereby render an audible radio program originated by the multi-channel information transmitter.

When a user (new user) wants to listen to an Internet radio program,
5    he or she will turn on the Internet radio software (on the computer). The Internet radio software will connect to the name server informing the name server about the IP address of the new user's Internet radio software. The Internet radio software will receive from the name server the list of available radio stations. The new user then selects the radio station and the Internet
10    radio software will send this information to the transmission scheduler 200.

The transmission scheduler 200 then instructions the information transmitter of the server 260 to start transmitting the information to this IP address (the IP address of the new user) too, or it will instruct one of the radio
15    softwares of a user that is already listening to the same program to forward the information to this new user. Therefore, the new user will receive the data either directly from the server, over the Internet, or from another user that is already receiving the information. The new user can then later be asked to provide, e.g., forward broadcast information to another user.
20

During the act of receiving information, the users' radio software will periodically inform the server 260 that they are still listening and the speed at which they are receiving information. When the user turns off his/her radio, the scheduler 200 and name server will be informed, and if they were
25    forwarding information to other users, the forwarding will be rescheduled to other users or to the server 260.

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Although any communication protocol can be used for the communication links of Figure 3A and Figure 3B, communication channels can be established using the Prody Phone Internet Telephony functionality as provided by Mindmaker, Inc. of San Jose, California in the Intelligent

5    Assistant software products. Also, radio stations all over the world can make their products available over the Internet 300 for millions of listeners using the Internet radio software.

Although the example of a radio program is used, the broadcast

10   content can also be a television program or other audio/visual information or a software program, etc.

The preferred embodiment of the present invention, a system and method for communicating digital broadcast content to multiple users, pseudo

15   simultaneously, without being constrained to the bandwidth of the server-to-Internet connection, is described. While the present invention has been described in particular embodiments, it should be appreciated that the present invention should not be construed as limited by such embodiments, but rather construed according to the below claims.

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CLAIMS

What is claimed is:

5      1.    A method of communicating broadcast information comprising

the steps of:

       a) causing a server to communicate a first stream representing digital

broadcast information to a first user device wherein said server and said first

user device are coupled to the Internet;

10      b) causing said server to communicate a second stream representing

said broadcast information to a second user device wherein said second user

device is coupled to the Internet;

       c) causing said first user device to communicate a third stream

representing said broadcast information to a third user device wherein said

15    third user device is coupled to the Internet; and

       d) rendering, pseudo simultaneously, said broadcast information on

said first, second and third user devices.


       2.    A method as described in Claim 1 wherein said broadcast

20    information is a radio program.


       3.    A method as described in Claim 1 wherein said broadcast

information is a television program.


25      4.    A method as described in Claim 1 wherein said broadcast

information is a computer program.


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5.     A method as described in Claim 1 further comprising the step of

e) in response to said first user device shutting down, causing said second

user device to communicate a fourth stream representing said broadcast

information to said third user device.

5

6.     A method as described in Claim 1 further comprising the steps

of:

adding a fourth user device on said Internet; and

causing said second user device to communicate a fourth stream

10     representing said broadcast information to said fourth user device.

7.     A method as described in Claim 1 further comprising the steps

of:

adding a fourth user device on said Internet; and

15     causing said server to communicate a fourth stream representing said

broadcast information to said fourth user device.

8.     A method of broadcasting information over a network of electronic

devices, said method comprising the steps of:

20     transmitting broadcast information from a server to a first group of

electronic devices of said network; and

achieving pseudo-simultaneous broadcasting of said broadcast

information for said first group and a second group of electronic devices by

forwarding said broadcast information from said first group of electronic devices

25     to said second group of electronic devices of said network.

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9. The method as recited in Claim 8 wherein said step of achieving pseudo-simultaneous broadcasting further comprises the steps of:

establishing direct communication links between respective ones of said first group of electronic devices and said second group of electronic devices;

5  and

instructing said first group of electronic devices to transmit said broadcast information to said second group of electronic devices via said direct communication links.

10  10. The method as recited in Claim 9 further comprising the step of periodically updating status of said first and second groups of electronic devices.

11. The method as recited in Claim 10 further comprising the step of

15  by-passing inactive electronics devices of said first group by re-routing said direct communication links.

12. The method as recited in Claim 10 further comprising the step of terminating direct communications links that are associated with inactive

20  electronic devices of said first and said second group.

13. The method as recited in Claim 8 wherein said first and second groups of electronic devices each comprises a computer system configured for receiving said broadcast information and for forwarding said broadcast

25  information.

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14.    The method as recited in Claim 8 wherein said network of electronic devices comprises the Internet.

5

# CHAINCAST METHOD AND SYSTEM FOR BROADCASTING INFORMATION TO MULTIPLE SYSTEMS WITHIN THE INTERNET

## ABSTRACT OF THE INVENTION

5     A method and system for performing chaincast communication to multiple communication systems within a system of coupled electronic devices. In one implementation the electronic devices can be computer systems and the system of coupled electronic devices includes the Internet. The present invention provides a system wherein a broadcast source communicates broadcast information (e.g.,

10    encoded audio radio content, encoded audio/video television content, program instructions, etc.) to a first group of electronic devices. The first group of electronic devices can be instructed by a transmission scheduler to then communicate (e.g., forward) the broadcast information to other electronic devices which devices can also be instructed to communicate to more devices, etc., thereby reducing the

15    bandwidth requirements of the communication channel between the broadcast source and the first group of electronic devices. Slight communication delays may be encountered by the transmission forwarding, but these delays can typically be tolerated in broadcast transmissions (e.g., radio content, television content, seminars, etc.). The transmission scheduler, coupled to the Internet, is used to

20    track and manage which devices are forwarding broadcast information to which other devices. The transmission scheduler is able to re-route communications when one or more devices terminates or to provide better communication load sharing across the system. The communication is "chaincast" because the forwarding from one device to another, to another, etc., creates a logical

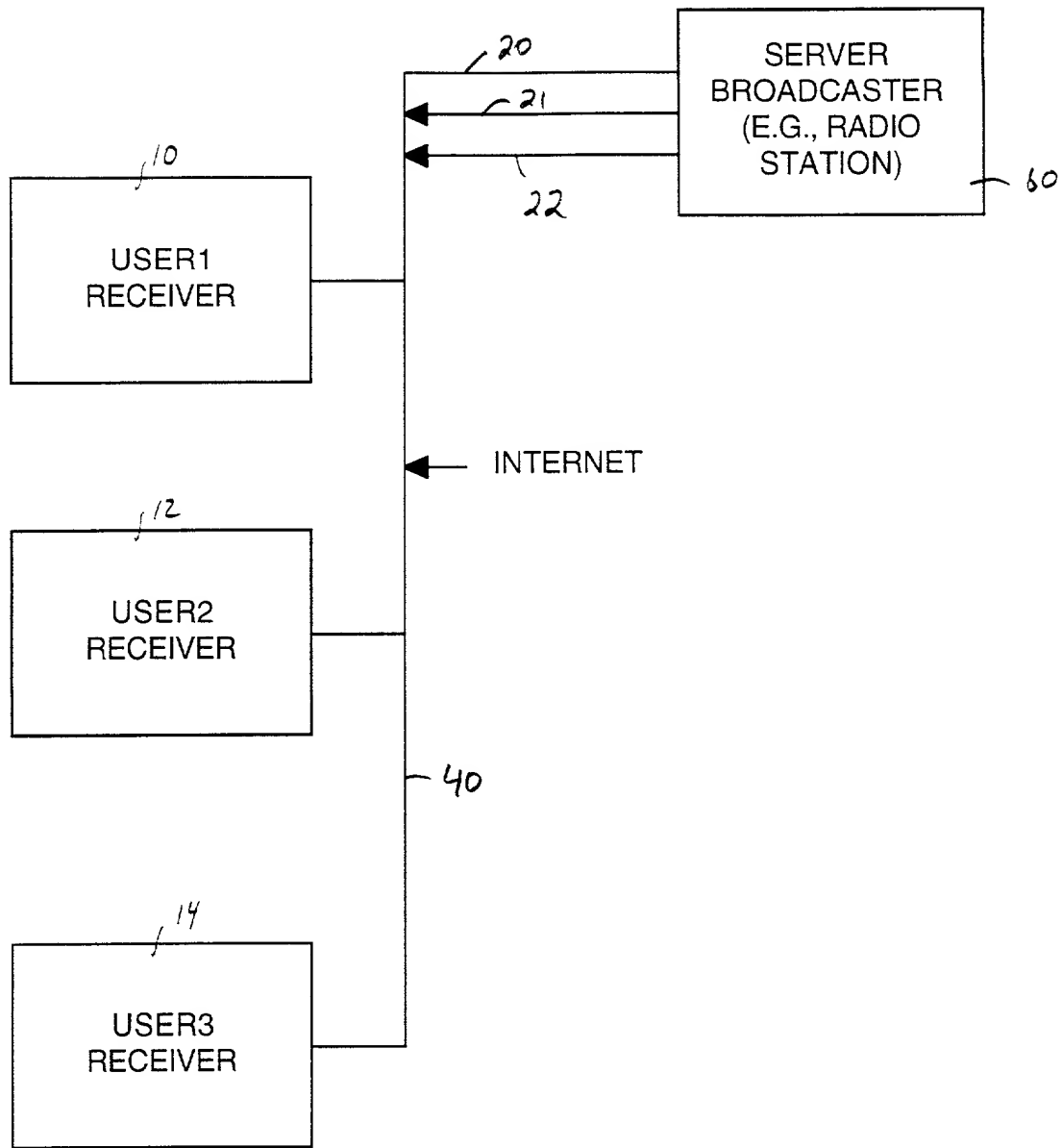25    communication "chain" from the broadcast server to the receiving devices.

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FIG.1
PRIOR ART

FIG. 2

TRANSMISSION
SCHEDULER     — 200

BROADCAST
SERVER     — 260

a1     —310     a2     311     a3     312          aj
                                        313
         •  •  •

b1     —320     b2     —324     b3     —326          bk     —330

c1     —322          c2     —328

# FIG. 3A

TRANSMISSION
SCHEDULER ⟋ 200

BROADCAST
SERVER ⟋ 260

311
312
313

a1 ⟋ 310    a2    a3    . . .    aj

320    324    350

b1    b2    340    bk

322

c1    c2

# FIG. 3B

TRANSMISSION
SCHEDULER

200

300

BROADCAST
SERVER

260

a1

b1

c1

a2

b2

a3

b3

c2

aj

bk

# FIG. 4

| IP ADDR | NAME ID | |
|---------|---------|---|
| | | — 400 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

TRANSMISSION
SCHEDULER

200

412          410
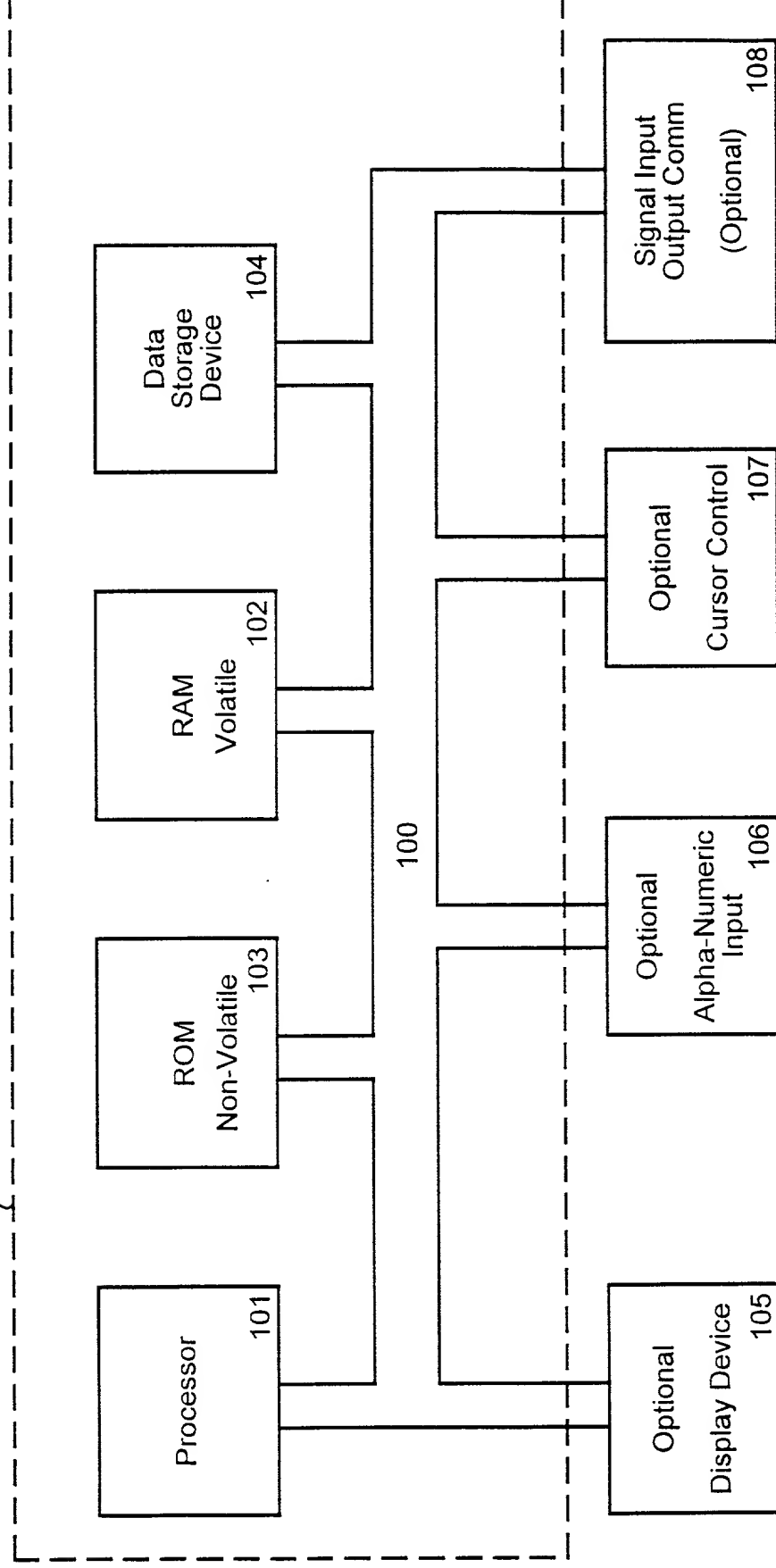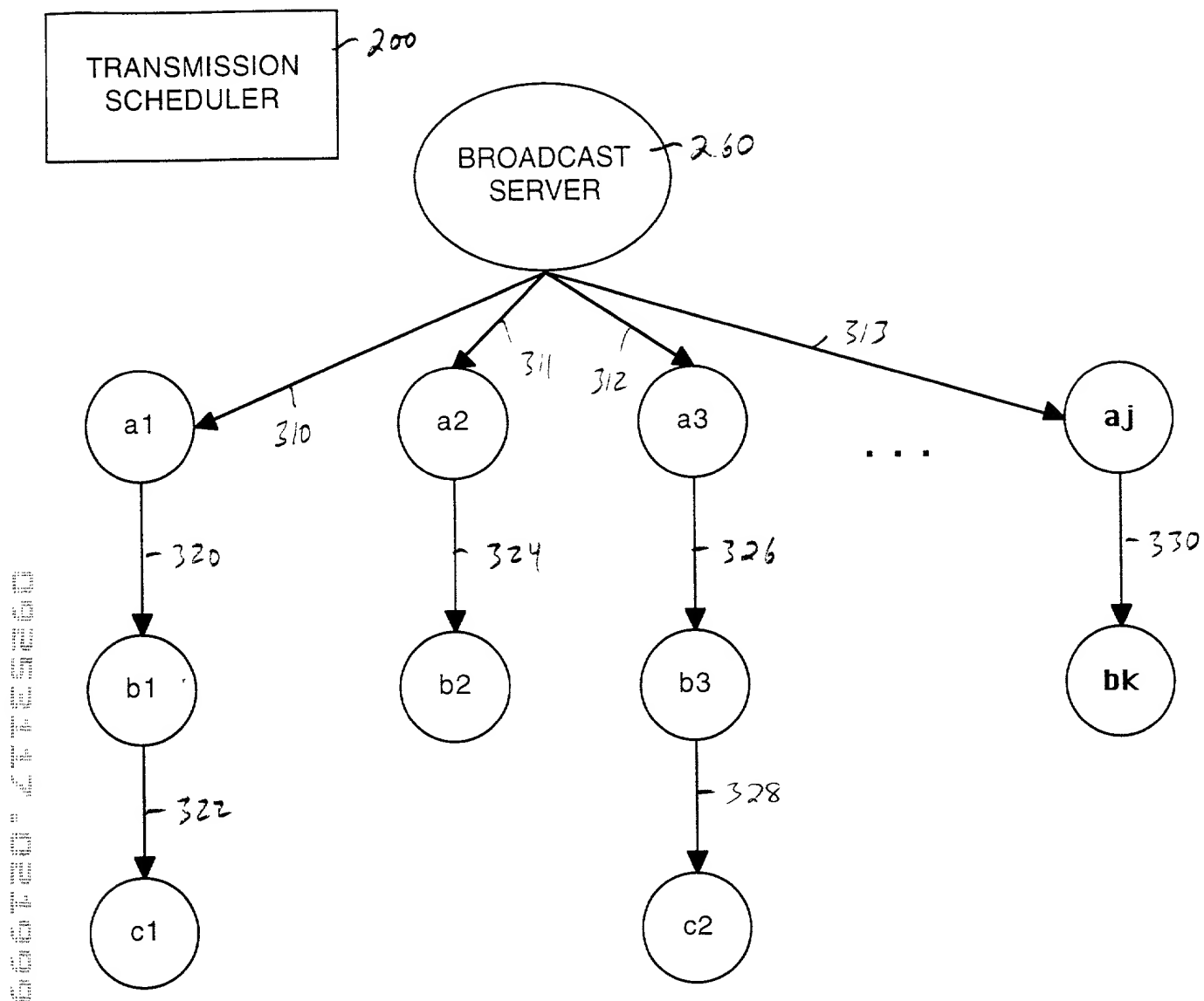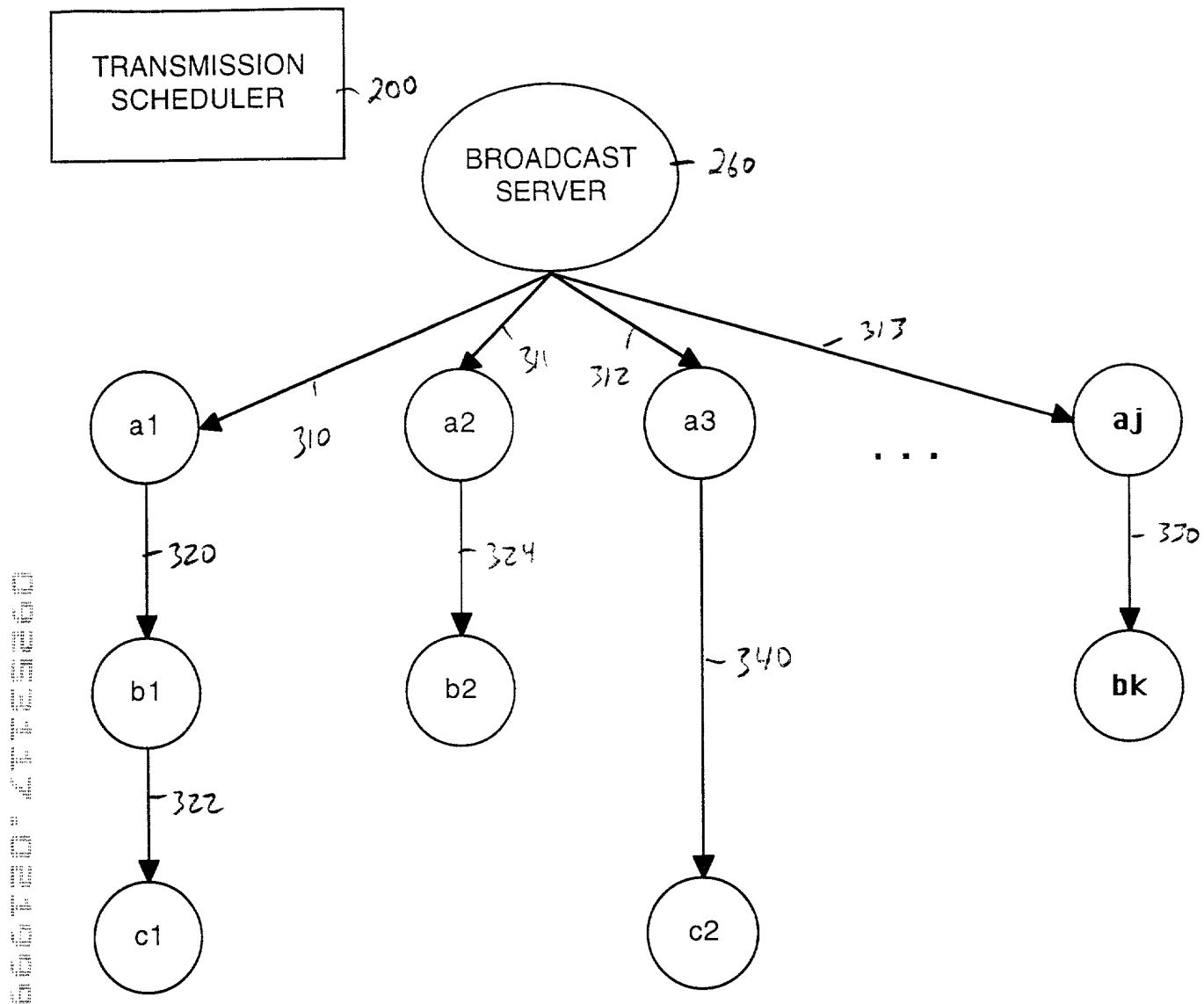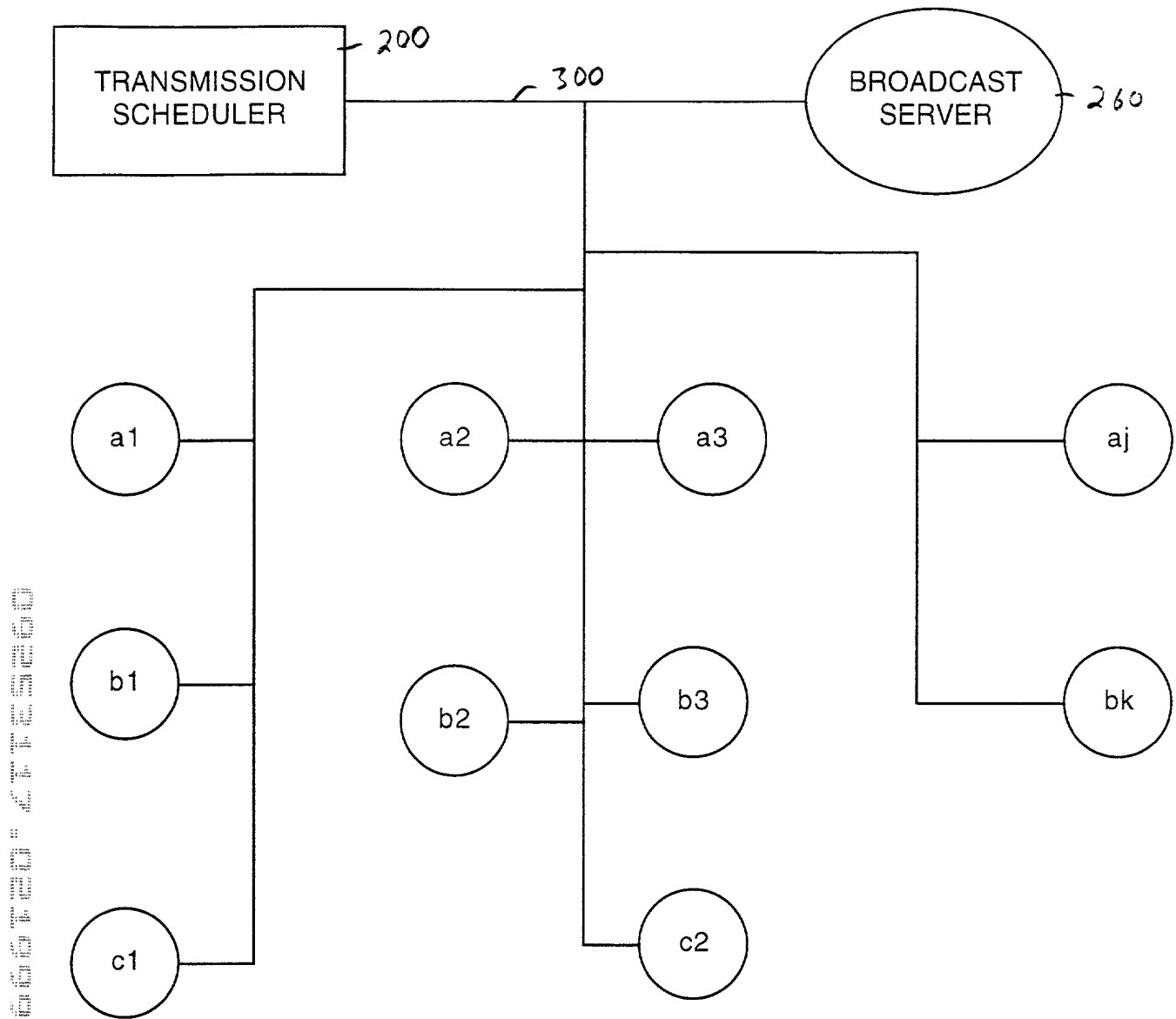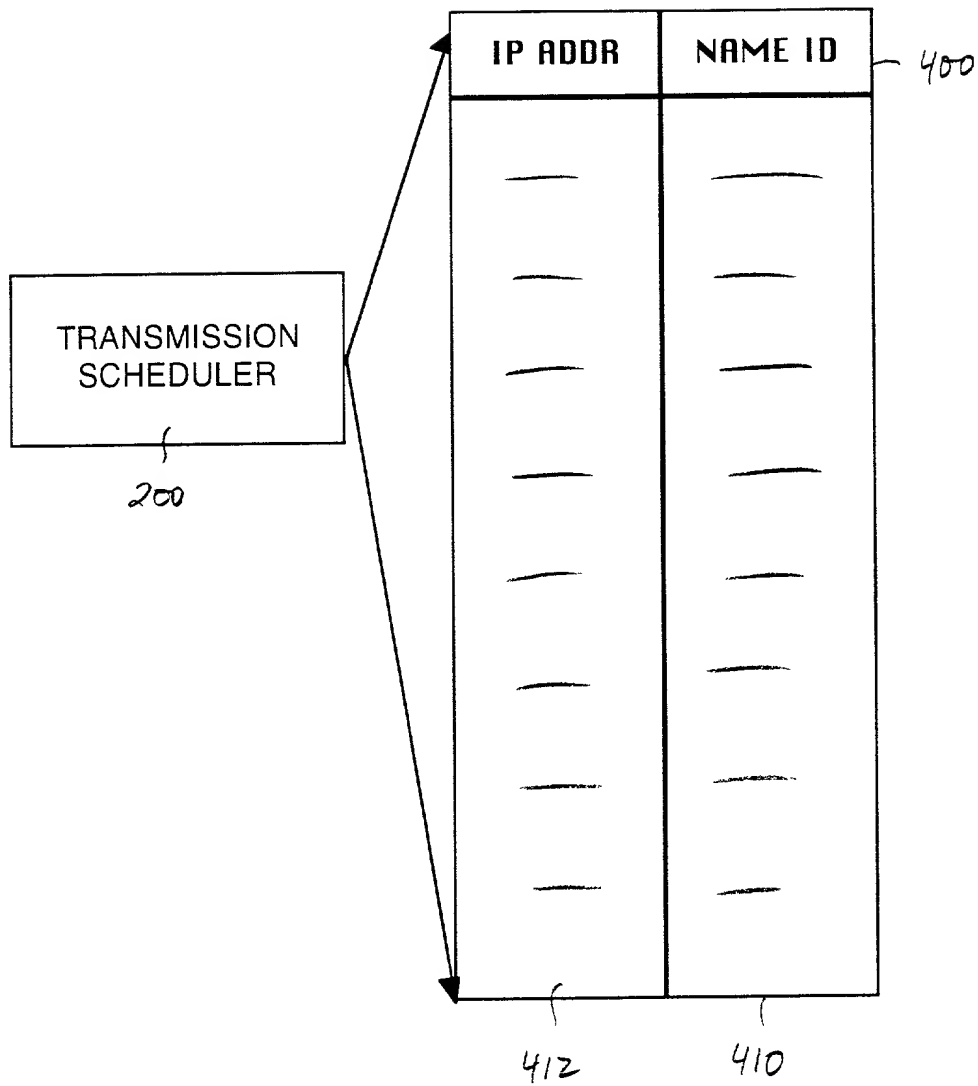
# FIG. 5

# Declaration and Power of Attorney
# for a Patent Application

## Declaration

As below named inventor, I hereby declare that my residence post office address, and citizenship are as stated below my name. Further, I hereby declare that I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

CHAINCAST METHOD FOR BROADCASTING INFORMATION TO MULTIPLE SYSTEMS WITHIN THE INTERNET

the specification of which:

   X    is attached hereto, or

.............. was filed on ................................ as application serial no. .............................. : and

.............. was amended on ...........................................

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above; and

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a).

## Foreign Priority Claim

I hereby claim foreign priority benefits under Title 35, United States Code Section 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

| Number | Country | Date Filed | Priority Claimed |
|---|---|---|---|
| ...................................... | ...................................... | ...................................... | ............ yes ............ no |
| ...................................... | ...................................... | ...................................... | ............ yes ............ no |

## U.S. Priority Claim

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

| Serial Number | Filing Date | Status (patented/pending/abandoned) |
|---|---|---|
| ...................................... | ...................................... | ...................................... |
| ...................................... | ...................................... | ...................................... |

rev 1/98 dbp

## Power of Attorney

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent Trademark Office connected therewith.

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## Signatures

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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